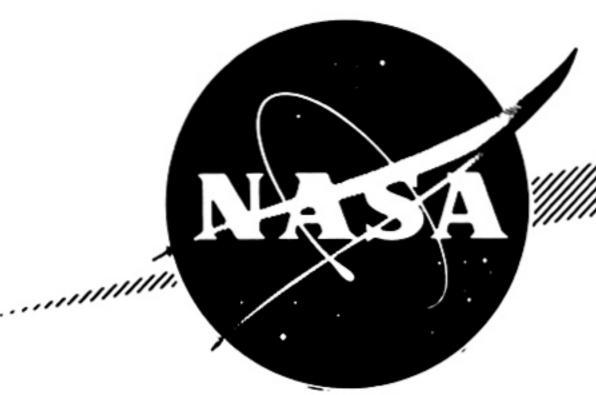
SPACEPORT



NEVS

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February 13, 1969

Apollo 9 Team on Schedule for February 28 Launch



KEY MEMBERS of the NASA Management Council participated recently in the Flight Readiness Review for Apollo 9 at the Spaceport. The consensus of the review was that Apollo 9 is on schedule for launch at 11 a.m., February 28. From left are Dr. George E. Mueller, Associate Administrator for Manned Space Flight; Lt. Gen. Samuel C. Phillips, Apollo Program Manager, NASA Headquarters; Dr. Kurt H. Debus, Director of KSC, Dr. Robert Gilruth, Director of the Manned Spacecraft Center, and Dr. Wernher von Braun, Director of the Marshall Space Flight Center.

MARINERS TO INVESTIGATE ENVIRONMENT

ULO To Launch 2 Martian Flyby's

KSC's Unmanned Launch Operations, directed by Robert H. Gray, is busily engaged in launch preparation for two Mariner Mars probes designed to investigate the physical, chemical and thermal properties of the Martian surface and atmosphere to help establish if the planet can support life.

NASA's Mariner Mars 1969 program calls for the two space-craft to pass about 2,000 miles from that planet. The first will be launched February 24 and the next March 24.

Gray said Atlas-Centaur vehicles 19 and 20 will be used to launch the probes from Complex 36 at Cape Kennedy. He said deep space probes are the most difficult of all automated spacecraft missions.

Mariner F, to be launched by Atlas-Centaur 19 February 24, will fly past Mars 157 days later,

on July 31. Atlas-Centaur 20 will send Mariner G on its trajectory on March 24, and the spacecraft will pass Mars on August 5, some 134 days after liftoff.

TWO SPACECRAFT

Each of the two spacecraft will be launched on different curving trajectories that will require a coasting voyage of 226.3 million miles by Mariner F and 193.4 million miles by Mariner G to reach the target planet, which will be approximately 62 million straight-line miles from earth at the time of the encounters. To shorten the flight time on the second mission, a more direct ascent mode will be used.

The first spacecraft, to be named Mariner 6 in orbit, will make an equatorial pass by Mars, and the second, Mariner 7 in orbit, will fly by the edge of the southern polar cap.

Gray said the two-launch mission has been planned to double the chance of success and, by flying the two spacecraft past different regions of the planet, to return as much useful data about Mars as possible.

The ULO Director said the launch vehicle will fly a powered direct ascent trajectory mode. This means there will be a nearly continuous thrusting by the launch vehicle from liftoff to injection of the spacecraft into a Mars transfer orbit.

The 117-feet-tall Atlas-Centaur vehicles, developed by General Dynamics-Convair under the direction of NASA's Lewis Research Center, are the largest and most powerful launch vehicles now used in NASA's unmanned spacecraft programs.

(See MARINER, Page 4)

CDDT Gets Underway After FRR

Preparations for an on-schedule February 28 launch of Apollo 9 are being pressed at KSC this week with the final dress rehearsal—the Countdown Demonstration Test (CDDT)—getting underway in mid-week. An earlier hurdle—the Flight Readiness Review—was passed successfully last week.

Spacecraft hypergolic loading and bringing the RP-1 fuel aboard the giant Saturn V first stage were completed over the weekend.

Apollo 9 is the second manned flight of the Saturn V, world's most powerful known rocket, and entails the first manned flight of the lunar module (LM), the buglike machine which is to land two astronauts on the lunar surface later this year.

CREW MEMBERS

The Apollo 9 crew is composed of James A. McDivitt, Commander; David R. Scott, Command Module Pilot, and Russell L. Schweickart, Lunar Module Pilot.

Major purposes of the flight, which includes the first extravehicular activity of Project Apollo, includes:

—Engineering evaluation of the LM;

—Prove out joint operations techniques involving the LM and command/service modules, with emphasis on communications and information gathering and dissemination;

—Testing of the Portable Life Support System (PLSS) and Oxygen Purge System (OPS) which provide life support to the astronaut when he emerges from the LM onto the lunar surface;

—Perform a turn-around of (See APOLLO 9, Page 4)

GE Supplies Electrical, Support Systems at KSC

The General Electric Company, fifth largest contractor to NASA, is the supplier of three major systems to be utilized during the pre-launch, launch, and flight of Apollo 9.

These three areas are:

- —Electrical and electronic systems for launch control and checkout
 - Spacecraft checkout systems
 Electrical support equipment
 APOLLO SYSTEMS

GE's Apollo Systems Department provides a wide range of equipment and design engineering management for checkout and control of the launch facilities used in NASA's Apollo Program. This hardware is known as Launch Control and Checkout Equipment (LCCE). Where other GE-provided systems check out and control the Apollo spacecraft and the Saturn launch vehicles, LCCE performs this function for many of the launch facilities.

Specifically, the various systems used for launch control and checkout of the space vehicle perform the following functions:

- —Provide operator controls and displays necessary to remotely service the launch vehicle by loading propellants, provide high and low pressure gases control, vehicle compartment conditioning, and controlling movement of service and holddown arms prior to launch.
- —Provide protection to the space vehicle, pad, and personnel with control and displays of a Firex Water Systems area warning system, purging system, and hazardous gas monitoring system.
- —Provide both visual and oral communications essential in controlling all operations during assembly and checkout of the space vehicle.

—Provide instrumentation checkout equipment necessary to validate performance and calibrate on-board sensors, transponders, and telemetry equipment.

—Provide and distribute critical power to all technical equipment and administrative facilities.

The LCCE gives NASA a broad launch support capability for the servicing, protecting, and checking out of the launch vehicle and spacecraft from arrival of the various stages at the KSC on through testing and assembly in the Vehicle Assembly Building and Manned Spacecraft Operations Building, and to final flight readiness verification at the pad prior to and during launch.

SPACECRAFT CHECKOUT

The Apollo Spacecraft will begin its complicated mission only after having received a thorough pre-launch testing from a vast complex of ground checkout equipment provided by the General Electric Company. Designated ACE-S/C, for Acceptance Checkout Equipment-Spacecraft, the system is capable of testing all spacecraft systems automatically. GE's Apollo Systems Department has fabricated and assembled fourteen of these spacecraft checkout systems.

The widespread use of these stations makes it possible to conduct uniform, standard tests and procedures, and to detect variances in the spacecraft systems while they are still at the factory, and then after they arrive at the Kennedy Space Center.

Six ACE stations are located at NASA facilities at the Kennedy Space Center; three are at the North American Aviation plant in Downey, California, (See GE, Page 5)

CONSTRUCTION-ENGINEERING

CAT-DOW Geared for Service

Catalytic-Dow, a member of the support contractor team at KSC, has made significant contributions toward launch readiness of Apollo 9.

Cat-Dow performs engineering and construction services on facilities at Launch Complex 39 and the Unified S-Band Station.

Three major projects accomplished for Apollo 9 were the Launch Complex 39 slide wirecab emergency egress system, service module-lunar module adapter (SLA) freon system and rehabilitation of the flame deflector quench system on Pad A.

Cat-Dow has also completed many needed minor modifications and repairs for the launch of Apollo 9.

CONSTRUCTION MODS

For example, between December 21 and January 31, 97 construction modifications were completed by Cat-Dow construction forces to support Apollo 9 milestones.

In addition, Cat-Dow's engineers completed approximately 219 engineering modification jobs identifiable with the Apollo 9 launch.

The firm's quality assurance team has also played a major role in the successful completion of work in progress. Cat-Dow quality men sometimes worked two successive shifts to handle heavy work loads and to ensure that design criteria were met.

Numerous inspections were conducted and an exhausting review of documentation and paperwork was conducted to make sure that highest quality standards were maintained.

To date, Cat-Dow has met the quality requirements on and completed almost 600 modification jobs on launch support facilities at KSC.

EGRESS SYSTEM

The slide wire-cab egress system was accepted by NASA on January 18 and was manrated by Bendix with Cat-Dow support on January 25.

The design concept for the Apollo 9 slide wire-cab system was determined just before the launch of Apollo 8. Since Cat-Dow resources were committed to the Apollo 8 slide wire with a harness system, KSC Design Engineering asked its Mechani-

cal Systems Division to do further design on the Apollo 9 slide wire.

Immediately after the Apollo 8 launch on December 21, Cat-Dow took that concept and, working closely with KSC Design Engineering, completed the detailed design work, prepared test procedures, procured hardware, fabricated the cab, and began testing the system on December 24. The cab was completed and retested early in January.

W.B. Walker was the Systems Engineer for Cat-Dow on this project. L.A. Vabulas and A.D. Clifton, Cat-Dow Project Engineers, coordinated the field efforts and design and procurement functions. F.L. Smith, J.H. Luster and W.F. Carter coordinated Cat-Dow's construction and fabrication efforts.

FIRE PROTECTION

Because an additional fire protection and suppression capability was needed for the SLA, the decision was made to add a freon system to existing systems.

Cat-Dow was asked to design, test and install this system for the Apollo 9 launch, and this system is now installed and ready for Apollo 9.

The system used various combinations of freon and water and can be used both in addition to and in conjunction with a water deluge system. It will be used in the event of fuel spill for fire prevention or, in case of fire, to suppress it.

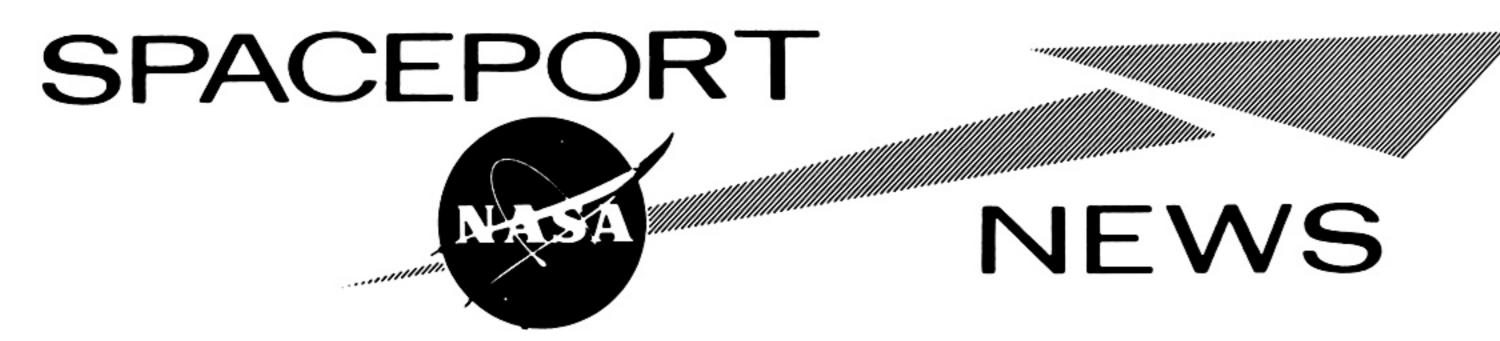
It is primarily designed to protect the men in the SLA area, but will also protect the facilities in the event of fire.

JOB COMPLETED

Cat-Dow recently completed the installation of inerting sleds, sustaining bottles, water nozzles and the complex wiring and plumbing system.

T.E. Persinger was the Cat-Dow Project Engineer, P.S. Farley was the coordinator of construction efforts and R.A. Montgomery and D. O'Brien were responsible for testing the system.

The combined Cat-Dow crews of sprinklerfitters and pipefitters, working two 12-hour shifts for five days, replaced approximately 1,800 feet of rusted pipe in the flame deflector quench system at Pad A. P.S. Farley was Construction Superintendent for the work.



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Bendix Provides Direct Support for Vehicle Operation

The Bendix Corporation's Launch Support Division at KSC provides support required fo launch vehicle and spacecraft operations in NASA's Apollo program.

This includes operation, maintenance and site management of launch complexes, test facilities and ground support equipment.

Launch Support Division also is responsible for the requisitioning and dispersal of propellants and gases, storage and dispersal of ordinance, and operation of technical shops and specialized laboratories.

The division provides engineering functions which are necessary to support these activities.

Launch Support Division is made up of various departments, each responsible for different phases of launch support.

TRANSPORTER

Launch Complex 39 department is responsible for maintenance and operation of the giant transporter, a six-million-pound

tracked crawler which has been called the largest, slowest, noisiest, and strangest land vehicle ever devised by man.

The VAB and its multitude of systems, including elevators, cranes, platforms, hoists and the 500-foot vertical doors fall under Complex 39 department as does the Complex Control Center, Industrial Water Facility, major systems on Launch Pads A and B, Mobile Launchers and Mobile Service Structure.

Propellants Systems Components Laboratory (PSCL) is responsible for the chemical analysis on all propellant systems and components to assure that systems within the Saturn 5 and Apollo spacecraft are free from contamination.

High Pressure Gas Department maintains and operates the converter compressor facilities and the high pressure gas storage and distribution facilities at Launch Complex 39 and the KSC Industrial Area.

The Altitude Chambers Department is responsible for the operation of the test facility which puts Apollo spacecraft through simulated altitude runs of up to 250,000 feet above sea level (48 miles). Part of this support operations includes a three-man rescue team which is on hand to assist astronauts if problems arise during altitude chamber tests.

PROPELLANT HANDLING

Propellants, Life Support and Ordnance Department (PLSO) is responsible for receiving, handling, storage, transfer, sampling and testing of various ordnance and propellant materials.

The department also transports astronauts to the launch pads for test operations, and provides and maintains SCAPE suits and other protective equipment for handling toxic propellants. Technical Shops Department (TESH) maintains engineering and manufacturing including machine, facilities mechanical, paint, electrical, and electronic components repair shops.

In addition, TESH maintains a heavy equipment shop with technical personnel responsible for handling, lifting and movement of various launch vehicles and spacecraft.

Systems Safety Department provides monitoring of all highly hazardous operations for launch vehicles, manned spacecraft, ordnance and propellants and has authority in evacuating the complex during launch and maintaining security following each launch.

Other departments which are necessary in the launch support operations are Engineering Operations, Reliability and Quality Assurance Department, Industrial Operations, Logistics, Test Requirements Management, Spacecraft Test Support and Saturn 5 Test Support.

Non - technical departments necessary in the operations are Management, Ac-Contracts counting, and Industrial Relations.

FEC Operates Instrumentation Systems Here

organizations situated on KSC's 88,000 acres are connected and coordinated through a sophisticated "nerve" system made up of telemetry, communications, measurements, computation and timing.

The complex system is operated and maintained for NASA under a support contract held by ITT's Federal Electric Corporation (FEC).

FEC's Communications and Instrumentation Support Services project is headed here by T.J. Cameron, project director. Under him are five major departments.

Largest of these departments handles communications and timing under Manager Ralph G. Belon.

OIS RESPONSIBILITY

This department has total responsibility on the Space Center for the operation and maintenance of all communications and timing systems.

For instance, it handles the OIS — Operational Intercommunications System—which uses a combination of hardlines (wire

The buildings, equipment and and cable) and radio transmission capable of feeding video signals to maintain a multi-channel flow of voice and information between buildings, launch pads, launchumbilical towers and VAB.

> Even the huge transporters which carry the fully assembled launch vehicles and launch platforms from the VAB to the pads are included in the system.

> The same team of experts which operates and maintains OIS also handles OTV—Operational Television. It is a closed circuit system which provides a constant, dependable view of many areas at launch complex 39.

> FEC technicians operate and maintain some 60 closed circuit cameras at each pad to focus electronic eyes on such diverse subjects as critical fuel line connectors, or on the launch vehicle itself as it thunders towards the sky.

> Some are aimed into the searing heat of the rocket engine exhaust to give technicians a close-up view of a sight human eyes could not otherwise tolerate.

OTV CAMERAS

The OTV cameras are switched in a specially-designed center,

to monitors throughout the space center.

In addition, FEC operates NASA's color van, a compact remote color broadcasting setup. The department also has the responsibility for the operation and maintenance of police and fire alarm systems, intercommunications and timing for the entire center.

Dr. Blaine Sweatt, Jr., is manager of FEC's Telemetrics Department. Long before the Saturn launch vehicle inches toward the sky on its column of flame, FEC telemetrics technicians begin "listening" to data flow from the rocket on the performance of each system, each component. This flow of vital information continues as the vehicle is assembled and moves to the pad.

During the launch phase, information from the vehicle is collected and fed to computers, to other NASA centers via the Apollo Launch Data System (ALDS), and to a data display room, where representatives of NASA and stage contractors can receive stored or real time data they need.

COMPUTATION UNITS

Two computation departments are also operated for NASA by ITT's worldwide service associate. One, managed by James Spencer, handles such functions as engineering support, real time launch engineering, system design, problematical analysis, mathematical solution and analysis, data reduction and data storage and retrieval.

The second computation department is managed by Frank G. Roscoe. It handles analysis design and programming of commercial and industrial computer systems for NASA and other KSC support contractors. It also maintains software for the operating systems, and develops special utility packages and application techniques for unique installation needs.

FEC's measurements department units are under Richard W. Dell, manager. The department is made up of four groups.

CALIBRATION LABS

One, the calibration laboratories, has the responsibility for the calibration of all test equipment

(See FEC, Page 5)

Apollo 9...

the command / service module, docking with the LM and pulling it away from the S-IVB third stage;

—Two ground-controlled relights of the S-IVB;

—The big service propulsion (SPS) engine will be turned on five times with LM and command/service modules linked to evaluate the guidance system and determine the safety of a manual takeover.

—LM systems will receive a thorough testing in a series of docked and undocked maneuvers in space.

TASKS OUTLINED

The nation's attention was focused on the Spaceport in February 3 when Schweickart outlined his tasks in a Training Auditorium press conference dubbed "An Evening With Rusty Schweickart".

Schweickart, "the pride of Neptune, New Jersey", gave a detailed outline of Apollo EVA, flight pareparations and illustrated the use of the PLSS and OPS.

The Apollo 9 flight has already acquired its own, somewhat lighthearted nomenclature.

The small platform at the top of the LM boarding ladder has become the "front porch", the LM footholders for Schweickart during EVA have acquired the nickname "golden slippers" and the elliptical maneuvers to be performed during the flight have taken on such glamorous names as "football" and "mini football".

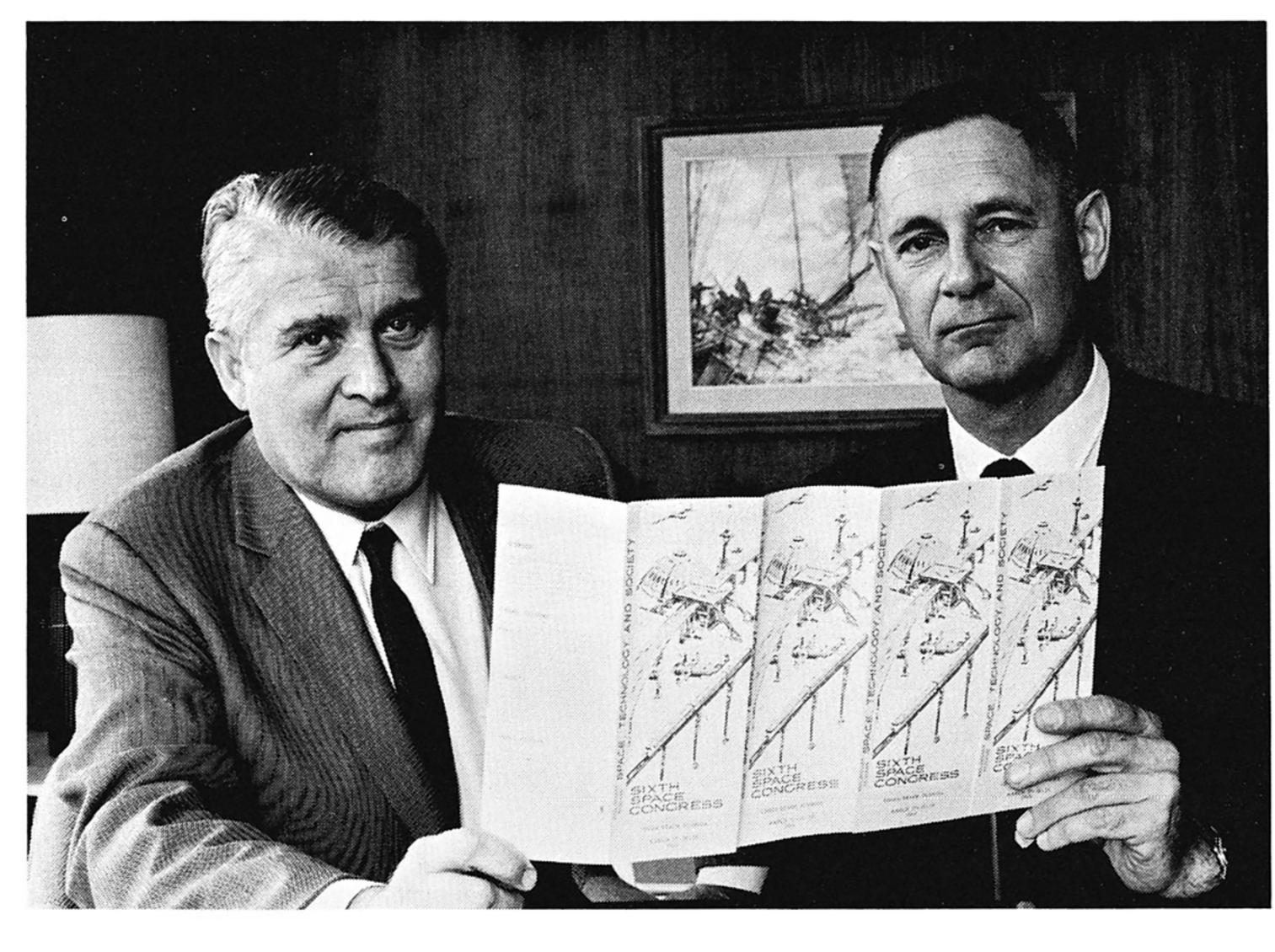
Also new on the Apollo 9 flight will be the complete shedding of the four Spacecraft Launch Adapter (SLA) panels from the third stage. These will be blown explosively away from the S-IVB to leave the LM exposed.

Mariner...

KEY MEMBERS

Other key members of the ULO team are John D. Gossett, Assistant Launch Director; Richard J. Mazurkiewicz, Test Controller; and Daniel Sarokon, Chief Launch Conductor for General Dynamics-Convair.

This team is backed by specialists from the ULO organization, other NASA centers, and the major launch vehicle and spacecraft contractors.



THE SIXTH SPACE CONGRESS, largest technical conference of its kind in the Southeast, is just a little over a month away. Looking over a program for the three day meeting are Dr. Wernher von Braun, Director, Marshall Space Flight Center, Congress keynoter, and Miles Ross, Deputy Director, Center Operations, Kennedy Space Center, General Chairman. The Sixth Space Congress will be held March 17-19 at Cocoa Beach with the Ramada Inn as headquarters motel. This year's theme is "Space, Technology, and Society."

The Mariner Mars 1969 missions are designed to keep the spacecraft outside the capture gravity radius of Mars to assure they do not impact and possibly contaminate the planet. They are primarily exploratory investigations to serve as the basis for future experiments in the search for extraterrestrial life.

The program is administered by the Office of Space Science and Applications of NASA Headquarters, with project management assigned to the Jet Propulsion Laboratory, California Institute of Technology.

JPL's ROLE

JPL has specific management responsibility for the development of the new Mariner spacecraft, operation of the deep space network, and direction of the flight operations from its control center in Pasadena.

Both Mariners will carry six experiments to probe Mars' environment, but they are not designed specifically to prove or disprove life on the planet. Hopefully, they will help establish the planet's origin and history and return data on such critical factors as temperature ranges and the presence of water that could be clues to the question of life forms.

Wide-angle and narrow-angle television cameras will take a series of pictures of the whole planet during the approach and closest passage.

This experiment is designed to acquire a large amount of pictorial data about the surface of Marsabout 30 times that taken by the Mariner 4 mission in 1964 from 6,200 miles out--and will yield a general map of the planet.

PICTURE COVERAGE

The far encounter pictures will start about 48 hours before the closest approach and cover a range of about 620,000 to 186,000 miles from the planet. The near encounter pictures will start about 12 hours before the closest approach when the range will change from about 4,000 miles to 2,000 miles.

KSC Plans TOS Launch February 26

The ninth spacecraft in the TIROS Operational Satellite (TOS) System will be launched by Unmanned Launch Operations (ULO) from KSC's Complex 17B, Cape Kennedy, at 2:35 a.m. February 26.

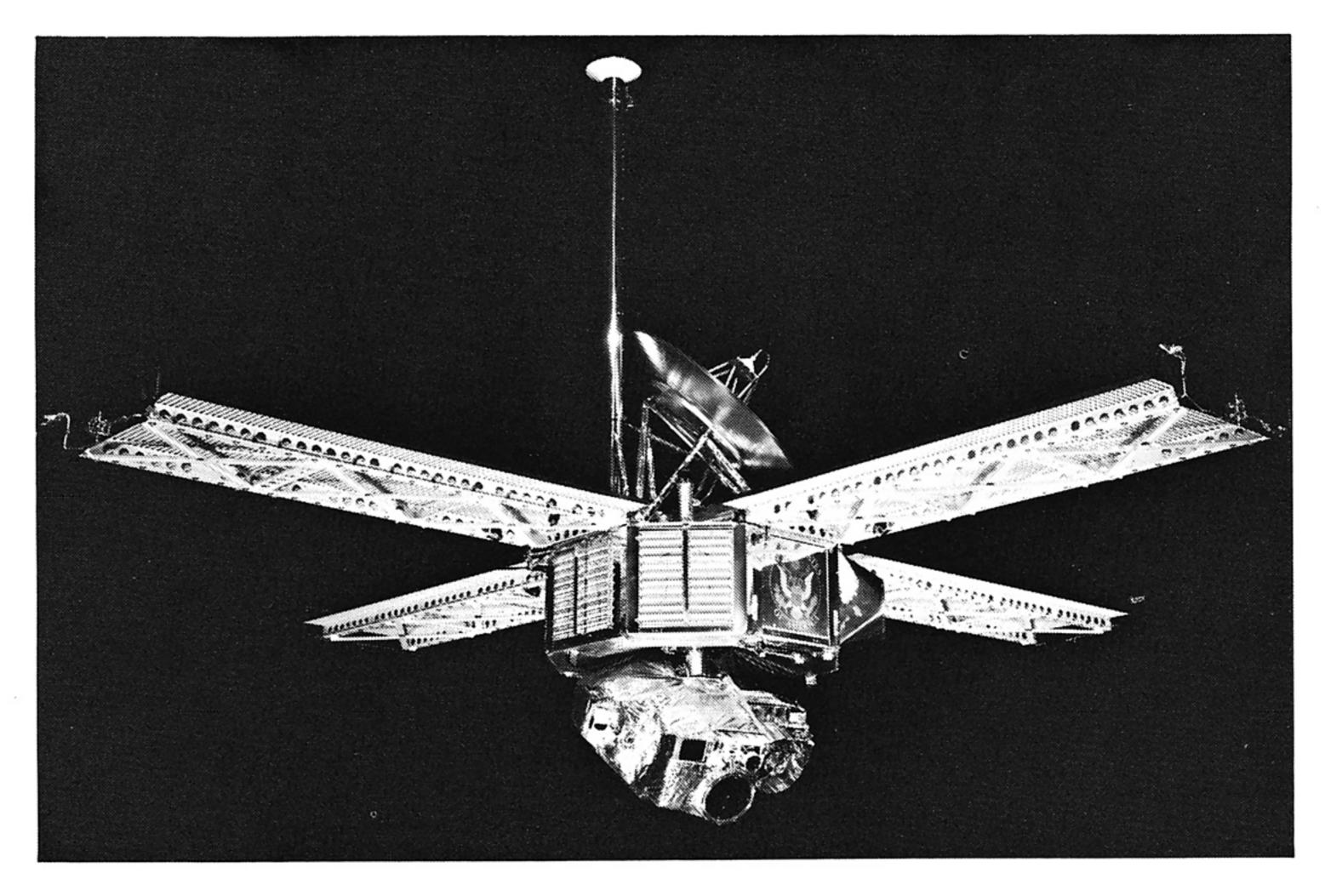
TIROS means Television Infra - Red Observation Satellite, and it represents the world's first series of operational meteorological satellites using television cameras for observation of the earth's cloud cover.

The TOS program is a joint effort by NASA and the Environmental Science Services Administration (ESSA) to provide daily weather observations.

ULO will use Delta-67 to orbit the TOS-G. ESSA had asked NASA to launch this mission as soon as possible to keep its satellite system fully operational.

ULO Director Robert H. Gray said that because these weather satellites must be placed in nearpolar orbits, they are usually launched from ULO's Western Test Range in California. However, since the WTR schedule is currently so tight that it cannot reasonably meet ESSA's urgent request, the most feasible method for keeping the system operational is to launch TOS-G from Cape Kennedy.

The launch vehicle must perform three precise "dog leg" maneuvers before it reaches its orbital injection point some 2,000 miles southwest of here over the Pacific Ocean.



MARINER-F SPACECRAFT



KSC DIRECTOR Dr. Kurt H. Debus, right, receives the first membership certificate of the 100 Missile Club formed here from Donald Hardin, left, Chief of the KSC Test Support Management Office. Dr. Debus is one of 30 charter members who participated in the first Redstone launch on August 20, 1953.

100 Missile Club Formed Here

The 100 Missile Club, an informal group of rocket veterans who desire to keep in touch as the space program expands, has been formed at KSC.

The 30 charter members of the club participated in at least 100 launches ranging from the first Redstone flight, August 20, 1953, to Mercury-Redstone 1, November 21, 1960.

This group was formed from veterans of the Army Ballistic Missile Agency, headed by Dr. Kurt H. Debus, now Director of KSC.

The club plans to offer invitations of membership to the Navy's Vanguard team formed at Langley Field, headed then by Robert H. Gray, now Director of Unmanned Launch Op-

erations at KSC, and the Atlas-Mercury team of Manned Space-craft Florida Operations, headed by G. Merritt Preston, now Director of KSC Design Engineering.

Charter members of the 100 Missile Club were:

Dr. Debus, Dr. Hans F. Gruene, Rocco A. Petrone, Karl Sendler, Albert Zeiler, Robert E. Gorman, Grady F. Williams, Robert E. Moser, Isom A. Rigell, Theodor A. Poppel, J. B. Russell, W. L. Gant, Vester L. Pinson, Andrew J. Pickett, Reuben L. Wilkinson.

Carl A. Whiteside, Robert N. Green, Carl H. Lipgens, Chester T. Wasileski, James K. Davidson, Thomas D. Pantoliano, William O. Chandler, Jr., Lester J. Owens, Jewel T. Campbell, James L. Jackson, Frank M. Childers, Or-



FIFTEEN CHARTER members of 30 that formed the 100 Missile Club, comprise a total of more than 300 years of rocket experience. They are, seated left to right, Albert Zeiler, Ike Rigell, Grady Williams, Theodor Poppel, W.L. Gant and J.B. Russell. Standing, left to right, are William Chandler, Jr., James Davidson, Robert Moser, Robert Green, Orval Sparkman, Frank Childers, Lester Owens, James Jackson and Reuben Wilkinson.



MR. AND MRS. Ken Curtis were visitors to KSC during the rollout of Apollo 9. In case you don't recognize the scutter with a beard, he's "Festus Hagen" of "Gunsmoke."

val Sparkman, Lafayette C. Taylor, Davis C. Manning and Fred Merritt (deceased).

GE...

where the Command and Service Modules are manufactured; three are at the Grumman Aircraft Engineering Corporation Plant in Bethpage, New York, where the Lunar Module is built; and two are at the Manned Spacecraft Center at Houston, where simulated space environmental tests are conducted.

In addition to the ACE-S/C System, the GE Ground Support System which is composed of the Common Usage Radio Frequency Checkout Equipment (CURF-OE) and the Quick Look Data Station (QLDS) will support the ground checkout and launch of Apollo 9. The QLDS is also expected to receive data during earth orbit of Apollo 9.

ELECTRICAL SUPPORT

The Saturn V vehicle for the Apollo 9 mission will be examined, inspected, tested, and controlled by the largest array of checkout equipment in the Apollo Program.

This booster diagnosis is accomplished through use of Electrical Support Equipment (ESE) developed and built by the Apollo Systems Department of the General Electric Company.

Apollo 10, 11 Hardware in KSC Pipeline

The moon-bound hardware for two Apollo flights beyond the earth-orbit mission of Apollo 9 in late February is in the KSC pipeline.

The Apollo 10 spacecraft was moved from the Manned Spacecraft Operations Building to the Vehicle Assembly Building last week and erected atop its Saturn V rocket.

Apollo 10, with a crew composed of Thomas P. Stafford, Commander; John W. Young, Command Module Pilot, and Eugene A. Cernan, Lunar Module Pilot, is to go into lunar orbit. Stafford and Cernan are to then enter the LM, detach it and swoop to within 50,000 feet of the moon before rejoining Young in the orbiting command/service module.

The Apollo 11 LM and command/service modules are in the MSOB where a simulated docking test was run on Monday and a de-docking test on Tuesday.

Apollo 11 is the first mission with hardware configured for a lunar landing. Its crew is composed of Neil A. Armstrong, Commander; Michael Collins, Command Module Pilot, and Edwin E. Aldrin, Jr., Lunar Module Pilot.

FEC..

used to support the Saturn program at KSC. It handles over 100,000 calibrations a year.

The reference standards group is charged with assuring that all units of measure used at KSC—such as electrical resistance, voltage, weight, length, etc. compare with those with the National Bureau of Standards.

The measurements laboratories make and calibrate systems used to measure such things as stress, strain, sound level, temperature, pressures, flow rates and meteorological data.

The fourth branch is the Saturn Operations and Field Measurements Organization. It is responsible for installation, maintenance and operation of the Information Systems measurements associated with the Saturn launch program.



KARS Budget Revised

A revised KARS budget for the last half of Fiscal Year 1969 has been approved by the Exchange Council, reports Fiscal Committee Chairman James J. Pirkle.

He said the new summary shows a total spending of \$100,756 for the fiscal year, compared to the \$94,611 that was originally budgeted.

To arrive at the \$6,145 increase, \$1,408 was added to the Competitive Sports Committee, \$4,252 was added to Arts, Crafts and Clubs and \$6,145 was added to Fiscal Committee, while \$2,500 was taken from Center Social Activities and \$3,160 was taken from Facilities Committee.

The revised budget shows the following amounts for committees during FY-69:

Competitive Sports, \$9,045; Arts, Crafts and Clubs, \$14,448; Ladies and Children's Committee, \$1,678; Fiscal Committee, \$7,695; Center Social Activities, \$3,200 and Facilities Committee, \$64,690.

A breakdown of the committees shows the activities or facilities and the amounts allocated to them:

Men's basketball, \$1,700; women's basketball, \$452; volleyball, \$400; bowling, \$750; fencing, \$85; fishing, \$400; golf, \$600; handball, \$100; softball and baseball, \$2,858; tennis, \$700; shooting competition, \$300; miscellaneous recreation area equipment, \$700.

KSC Chorus, \$4,190; Karate Club, \$631; Spaceport Flyers, \$600; skin and scuba diving, \$1,500; Amateur Radio Society, \$2,874; Ceramics Club, \$3,211; Chess Club, \$1,314; Amateur Rocket Society, \$100.

Playground equipment, \$772; Miss/Mrs. Contest, \$905.

Special Activities Director, \$3,-939; maintenance man, \$2,205; summer recreational assistants, \$1,550.

Continuous Center Social Activities reimbursable line item, \$2,500; summer picnic, \$500; and Travel Club, \$200.

Install playground equipment, \$135; construct tractor shed, \$550; install gate and flag pole in shooting area, \$325; construct ball fields, \$2,760; grass seed and fertilizer to prevent erosion, \$1,000; electrical power in recreation, radio and shooting areas, \$6,965; move NASA Tour buildings to shooting and recreation areas, \$3,335; white sand for kiddie area, \$29; miscellaneous equipment maintenance and supplies, \$3,696; swim facility, \$12,-500; clubhouse and golf course, \$100; lawn mower, \$206; walkways around skeet and trap ranges, \$720; caretaker and maintenance man, \$921; 10 picnic tables, \$850; 12 barbecue grills, \$840; flying site for model airplane club, \$500; dredge existing 800-foot channel to turn basin and add 400 feet and clean basin, \$5,780; install docks and seawalls, \$5,150; used truck for recreation area, \$1,635; 12 semi-portable umbrellas for tables, \$600; two artesian wells, \$928; display cases for trophies, \$300; clearing and grading 10 acres, \$5,000; aluminum canopies, \$3,000; self-loading skeet traps, \$1,360; range and radio clubhouse, \$4,000; summer hires, \$1,500.

RESERVATIONS

* * * * *

Special Activities Director Dan McMonagle reminds organizations to make reservations for use of the Complex 99 recreational area as soon as possible because the choice weekends are rapidly filling up. Both NASA and contractor groups are eligible to sign up.

RADIO SOCIETY

The Space Center Amateur Radio Society will meet in Room 2429, Headquarters Building, at 4:30 p.m., Tuesday, February 18. Government and contractor employees desiring code and radio theory training for FCC novice or higher license to operate an amateur radio station are urged to attend.

ULO Launches 3 Missions in 15-Day Period

Within a 15-day period—from January 22 to February 5—KSC's Unmanned Launch Operations launched three successful automated missions.

ULO Director Robert H. Gray said the three launches were made with Delta rockets, which have been used in 66 of NASA's 113 unmanned missions from Cape Kennedy and the Western Test Range.

The latest launch—Intelsat 3—also marked the 62nd successful launch for the workhorse of NASA's launch vehicles.

On February 5, Delta-66 roared aloft from Complex 17A, placing the commercial communications satellite into a highly eliptical transfer orbit with an apogee of about 22,000 miles and a perigee of 165 miles.

INTELSAT-3

Intelsat-3, owned by the International Telecommunications Satellite Consortium, will be positioned in a synchronous equatorial orbit 22,000 miles over the Pacific Ocean.

It can carry up to 1,200 twoway voice circuits or four color television channels simultaneously, and will more than double the commercial communications capacity between all areas across the Pacific.

On January 29, ULO's Western Test Range launch team used the Delta-65 rocket to put an International Satellite for Ionospheric Studies (ISIS-A) into a near-polar orbit ranging from a high point of 2,200 miles to a low point of 300 miles.

The ISIS-A mission is a joint United States and Canadian program to investigate the environment of space through direct observations in the ionosphere, an atmospheric shell starting about 50 miles above earth.

DELTA-65

Delta -65 — called the Thrust Augmented Improved Delta—was a three-stage rocket using a short tank Thor first stage, and was

CERAMICS CLUB

KARS Ceramics Arts and Crafts Club is taking applications for the Beginners Class in ceramics. For further information, call Retha Olsen, 452-4128.



WASHING mud from behind electronic equipment at Western Test Range Facilities is Robert H. Gray, Director of Unmanned Launch Operations at KSC. Gray was in California for the Delta-ISIS launch during the flooding which followed massive rains.

augmented by three strap-on solid propellant motors.

Delta-64—the last of the early model Deltas with a "skinny" second stage tank, no solid boosters, and the third stage/spacecraft assembly enclosed in an extended bulbous fairing—was launched from Complex 17B on January 22.

ULO PRAISED

Unmanned Launch Operations
Director Robert H. Gray recently
received a letter from Nick Sinder,
Grumman Orbiting Astronomical
Observatory Program Director,
praising ULO's contribution in
making the mission a success.

He said that during the first 30 days of operation, the experimenters— Wisconsin University and Smithsonian Observatory—have been able to observe and study more than 200 stars and regions and accumulate a great deal of data.

The mission payload, a 645-pound Orbiting Solar Observatory, is a spin stabilized space platform carrying eight scientific experiments that will be used to make direct observations of the Sun and its influence on the earth's atmosphere, weather and communications.

CONTRACTOR NOTES

Pretty Stolen Badge Returned

It was only a two-bit badge, but the principle of the matter was much higher.

The pretty yellow badge with a blue rim and a silver Saturn V stitched on it was returned recently to TWA, which operates NASA tours, with the following message scrawled by what looks like a third grader's writing:

"I stole this badge. I am returning it."

The envelope had a Reading, Maine postmark, but the message was on Miami stationary.

TWA Director George Friedrich made this evaluation of the matter:

"What it looks like to me is that little boy who sole it had conscience problems, or his mother caught him at it.

"But I'd say it look like conscience, because if she'd caught him, they'd have mailed it in Miami.

"I thought, in times like these, it's encouraging."

PEDRICK APPOINTED

Allen R. Pedrick has been named supervisor of the Operations Evaluation and Procedures unit at North American Rockwell (NAR) Launch Operations. He will handle special system audits to analyze management systems.

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MACLEAN CONDUCTOR

Donald A. Maclean is the new Test Conductor of the Delta program at the McDonnell Douglas Astronautics Company's Florida Test Center. His first launch in this assignment was Delta 64.

PARSONS SUPERVISOR

NAR Launch Operations has appointed Richard Parsons General Supervisor of Program Planning and Controls. He is responsible for planning and control of budgets in the Apollo/Saturn program.

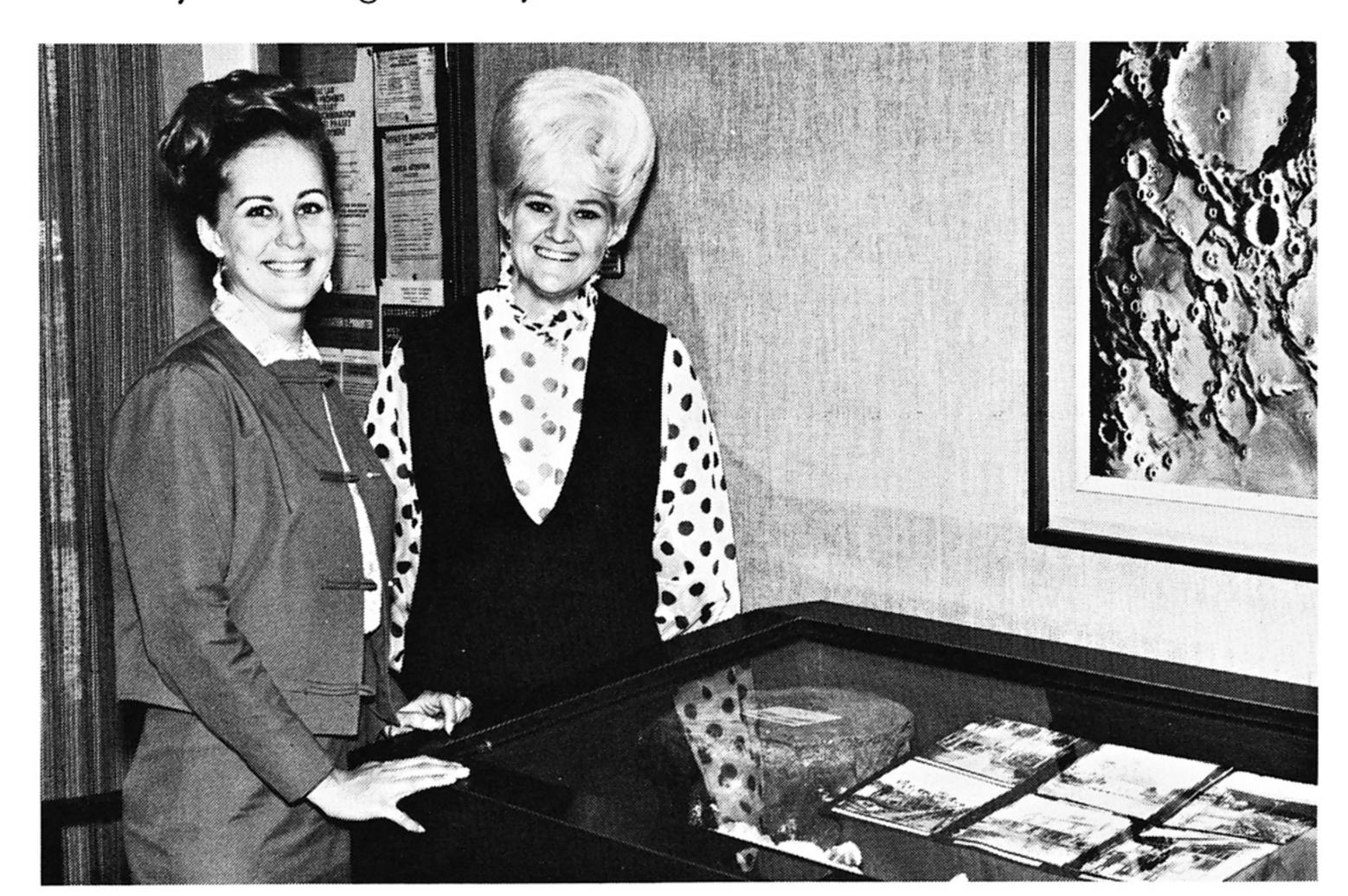
SMITH HONORED

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R.K. (Ken) Smith, a Project Specialist with the General Electric Company's Kennedy Operations, was honored recently under NASA's Manned Flight Awareness Program. He received an "Outstanding Performance" certificate signed by KSC Director Dr. Kurt H. Debus and a color Apollo 8 liftoff photograph. He and his wife, Diane, were guests of NASA for a tour of the Center and reception the night before the launch of Apollo 8.

Weather

Telephone number for recorded weather information is 7994.



TWO NAR secretaries, Pat Morris, left, and Toni Ingalls, look over the new display of prehistoric fossils and early Florida photographs rediscovered in Brevard County. The display was presented to the company by the Brevard County Historical Society placed in the main lobby of NAR Launch Operations Headquarters.



FINAL PAYMENT of \$3,771 from contributions given by Mc-Donnell Douglas employees were turned over recently to the Brevard County United Fund. A total of \$22,345 was donated. Fred V. Edmonds, left, Assistant Director for Administration, presented the checks to Clinton Voss, five-year-old student, and Miss Jean Cawelti, Executive Director of the North Brevard Rehabilitation Center Normandy School in Titusville.

GORE SELECTED

Robert Gore has been named to head the new Apollo Applications group at NAR Launch Operations. The group will aid in the formulation of program plans and will support the command and service module systems design.

MATTIS RECOGNIZED

A Bendix Technical Shops employee, George E. Mattis, has been named Launch Support Division's Man of the Month for February. He was selected for his "efficiency in reducing costs yet improving the quality of work in the shops."

CLARK GETS PIN

Cleo M. Clark, Saturn Launch Operations Supervisor for the Mc-Donnell Douglas Astronautics Company at the Florida Test Center, recently received a 15-year service pin award from the company.

SECTION HONORED

Ray Thomas, Manager of Bendix' Technical Shop Department, announced that General Foreman Joe Hunt's Heavy Equipment Section has received a plaque for its outstanding performance during the last quarter.

TOP SECRETARIES

Mrs. Shirley Trestik and Mrs. Donna Yon have been named Bendix "Secretaries of the Month" for January and February, respectively.

"PAPER" TRIP

Gwen White, NAR Launch Operations employee, plans to use money raised by selling truckloads of newspapers, magazines and discarded computer punch cards to take 20 members of the Palm Chapel teen-age choir to Philadelphia and Washington, D. C., this summer.

SAVINGS WINNERS

The Technical Services Department of NAR Launch Operations has won the Buc Trimmer Trophy for the second time in Fiscal Year 1969 for having the highest percentage of savings per employee. S.L. Anderson, Quality and Reliability Assurance Department, was named "outstanding contributor."

IBM CONTRIBUTION

Cape Kennedy IBM Club president Joseph D. Amato recently presented a check for \$4,175 to the Community Services Council of Brevard County, bringing the final contribution to \$15,661.

NAR FELLOWSHIPS

Applications for the 1969-70 Engineering Fellowships, available to qualified NAR Launch Operations employees, are now being accepted by the Manpower Development department. A Work-Study Fellowship and Full-Study Fellowship are being offered for employees seeking either a Master's or Doctor's degree in engineering, science or mathematics.

TWA Fills ''Base Support'' Needs at KSC

NASA Tours have stopped. It is two hours before launch.

Hardware contractorshavedone their jobs—and so has TWA.

The firm provides what is called "base support." It operates medical services, and it conducts NASA Tours.

More than 200 launch-oriented jobs are performed by TWA employees. ASI provides janitorial service, and Wackenhut security and fire—both subcontracting to TWA.

Robert E. Maxwell stands by in the Launch Control Center. The area manager of test support, he is the single contact with NASA at launch time. His job is to make sure support is on time and where it's needed.

Computers are handling the countdown. Electrical Utilities Manager Fred Jensen is keeping an eye on the flow of electricity that powers the generators, and provides air conditioning that cools them.

RESCUE TEAM

Fire Chief A.R. Weldom of

TWC thinks about his astronaut rescue team stationed 2,400 feet from Pad A. Their job is to save the astronauts if there's trouble on the pad.

Over in mail and distribution, Supervisor Al Nelson is ready for a breather. Some 14 million pieces of correspondence were delivered in 1968. Fifty-eight couriers now are making sure that "classified" or "priority" launch messages between contractors and NASA are being delivered.

A nine-man team of "health" engineers from Medical are standing by in a fallback area. Al Buck is sure the water he checked inside the spacecraft is okay for the astronauts. Bill McCray is ready to return to the pad after liftoff to check the air for oxygen content—a safety measure before workmen can return.

SAND CLEANING

The sand that will be used to "clean" the mobile launcher after launch for painting is a delivery job given to W.F. (Bill) Pontis of the TWA transporta-

tion unit. Pad Leader P. C. O'Keefe will oversee the work.

The shipping department in Supply has shipped many things from KSC for contractors and NASA. You name it, it's been shipped, says Don Butler, a supervisor. Even the astronauts' waste matter has to be shipped to Houston after they've returned from a mission.

Supervisor George R. Carroll is in the opposite end of shipping, delivering almost everything that arrives at KSC except spacecraft and stages.

Did you order something from another part of the country that is "launch critical" and it's hung up in somebody's storage area in Chicago? Rita Deist has found it for you and it's been delivered. If it had not, the launch might not be set for today.

KSC LIKE CITY

America's spaceport is very much like a small city. But it's complicated with about 33 subcontractors, all with special needs. Taking care of that city of 18,000

persons is a job assigned to TWA. KSC is dotted with more than

80 buildings. It is laced with 150 miles of roads, 350 miles of drainage canals and ditches and there are 20 miles of water mains.

Some men cut grass. Some scamper about 445 feet atop a mobile launch tower making repairs. Others help with water for the "deluge" system at the pad that cools the flames of the Saturn 5.

And there are sewage plants, heating plants, sheet metal and repair shops. TWA operates the utilities, maintains the roads, grounds, buildings and keeps 50,000 line items in supply. It takes 3,000 persons to do the job—2,400 TWA and 600 TWC and ASI.

DRY LUBRICANT

A dry lubricant compounded by space engineers is available for commercial use. When sprayed on ball bearings and heat treated, it lubricates at temperatures up to 1,200 degrees F.

LTV's STC Carries Out Wide Range of Assignments

From prelaunch tests to postlaunch briefings, Service Technology Corporation at KSC carries out a wide range of assignments in support of the Apollo 9 mission.

"Our 250 employees here are directly involved in launch-related work such as maintaining test documents required for manned space flights," said STC Project Manager H.J. Hays. News writing, the preparation of publications and data management are other projects.

"We also operate the Spaceport's library, which stores and distributes thousands of documents related to Apollo 9 and the entire space program," Hays add-

Service Technology Corporation is a subsidiary of LTV Aerospace Corporation. The contractor has been a member of the KSC team since 1964.

INFORMATION SERVICES

STC and its subcontractor, Mc-Gregor & Werner, Inc., provide information services at the Spaceport.

Robert P. Senecal heads the diverse STC Publications Department.

"One of our prime responsibili- With so many editorial products ties," said Senecal, "is maintain- it is important to avoid duplicaing documents which are used in checking out and launching space vehicles, including Apollo 9." In this instance the Technical Writing Group supports the KSC Launch Operations Directorate.

The Documentation Group deals with test and checkout plans for ground support equipment, located mostly in the Vehicle Assembly Building and the Central Instrumentation Facility. This group will also document Apollo 9 post mission informa-

PAO SUPPORT

For the KSC Public Affairs Office, STC employees prepare news releases and brochures, conduct tours and perform other editorial assignments. Duties of the Public Affairs Group include audio-visual support at KSC management briefings, and general writing projects.

Preparing charts, viewgraphs and original art for the Apollo 9 mission is the job of the Graphics Group. Information used in the preparation of charts, brochures and other publications is reviewed by STC Editing.

tion and insure that papers and forms accomplish their intended purpose. This is the job of the Data Management Group.

The bulk of the paperwork required at the Spaceport to test and launch a sophisticated space vehicle, like Apollo 9, is printed by McGregor & Werner, Inc.

In addition to printing and reproduction, the STC subcontractor microfilms engineering drawings. More than 700,000 drawings are now stored on microfilm, available for immediate use when needed.

SOVIET VIEW

"Space research is not as expensive as it is useful. It promotes science and develops technology, but it also has great economic importance. It makes possible increasingly precise weather forecasts; it facilitates air and sea navigation. It makes topographical research simpler. And its importance for defense is enormous."

—Boris Pavovich Konstantinov, Vice President, Soviet Academy of Science.

WORKLOAD RISES

As the Apollo program gathers momentum, the McGregor-Werner workload picks up.

"We are handling about 14 million printing units per month," said James H. Black, McGregor-Werner Project Manager. "Much of this volume is directly related to launch operations."

Scientific and technical information is made available by the KSC Library, operated by Service Technology Corporation. The Chief of the Library and Forms Control Section, Vincent Rapetti, said that his staff maintains more than 150,000 launchrelated documents.

This is in addition to the 20,000 volumes on file at the library. "Of course," said Rapetti, "there are several hundred thousand documents on microfilm."

The KSC Library circulates about 100,000 items a year.

Forms control is another STC function at the Spaceport. This office supervises the creation of new forms, circulates existing forms, and distributes administrative documents.